



# **Inmarsat SwiftBroadband and the next generation of aviation communications**

**NBAA Maintenance Management Conference  
Dallas, Fort Worth, Tx**

Charlie Clark  
May 2013



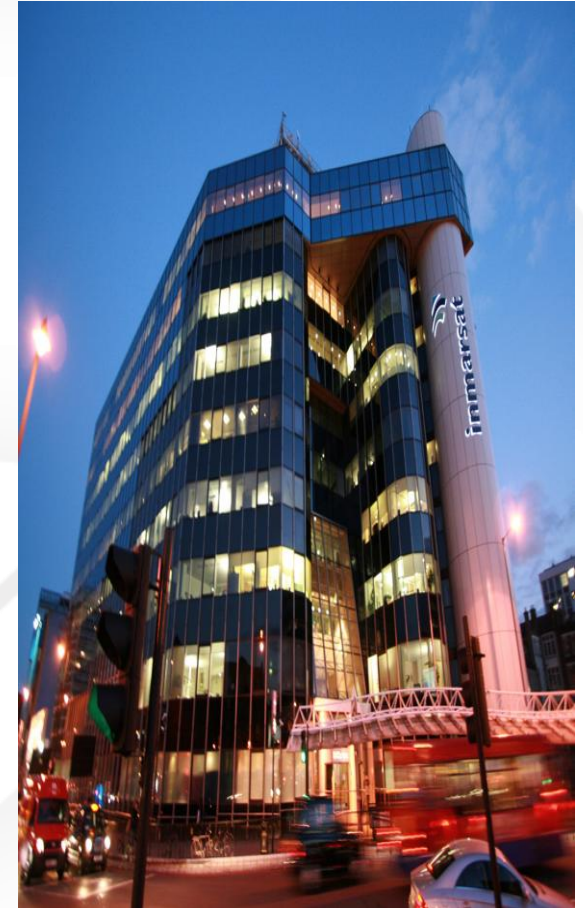
# Agenda

- > Who are Inmarsat?
- > Inmarsat 4 Footprint & Network Services
- > SwiftBroadband Experience
- > Inmarsat SwiftBroadband Services in the Future
- > The Next Generation - Global Xpress in Aviation

# Who are Inmarsat

## International Maritime Satellite Organization

- British satellite communications company
- Based in the City of London
- Founded in 1979 – 34 years ago
- Initially to provide safety services to maritime community
- Owns and operates 10 geostationary satellites
- Global, mobile voice and data services
- Providing wholesale airtime to Distribution Partners and Service Providers



# The Inmarsat Aviation Market

## Established, delivering, growing

- Continued strong growth in Aviation installed base and revenue
- SwiftBroadband driving growth - over 3,900 activations
- Key trends:
  - Business aviation recovery and globalization
  - Emergence of AT passenger connectivity revenues
  - E-enabled aircraft driving strong growth in AT datalink
  - King Air to A380
- Major opportunities for SB200
- Market interest in SB Safety and AOC IP applications



### Aviation



**14% of 2012**

#### **Inmarsat Global MSS revenue**

- 15,000 terminals
- 65-70% government business
- Drivers: ATS, AOC, ISR, corporate IT, passenger connectivity
- Key services: SwiftBroadband – simultaneous voice & broadband data; SB200 – small business jets; Classic Aero
- Commitment to aviation safety
- Unrivalled capability, flexibility

# Who are the players...

...meeting the Business Aviation demand?



Satellite communications. And more.™



ARYCOM

COMUNICAÇÃO VIA SATÉLITE





# **Inmarsat 4 Footprint & Network Services**



# Frequency spectrum

88MHz

106MHz

144MHz

800/900MHz

1200MHz

FM

Aircraft

GSM/AMPS



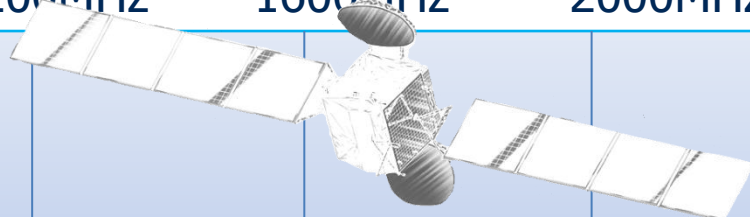
1200MHz

1600MHz

2000MHz

2800MHz

3,600MHz



**L-Band**

**S-band**

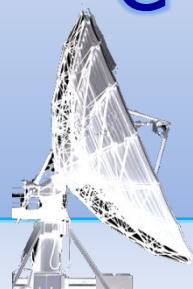




3,600MHz

6,000MHz

C-band



11,000MHz

14,000MHz

18,000MHz

30,000MHz

**Ku-Band**

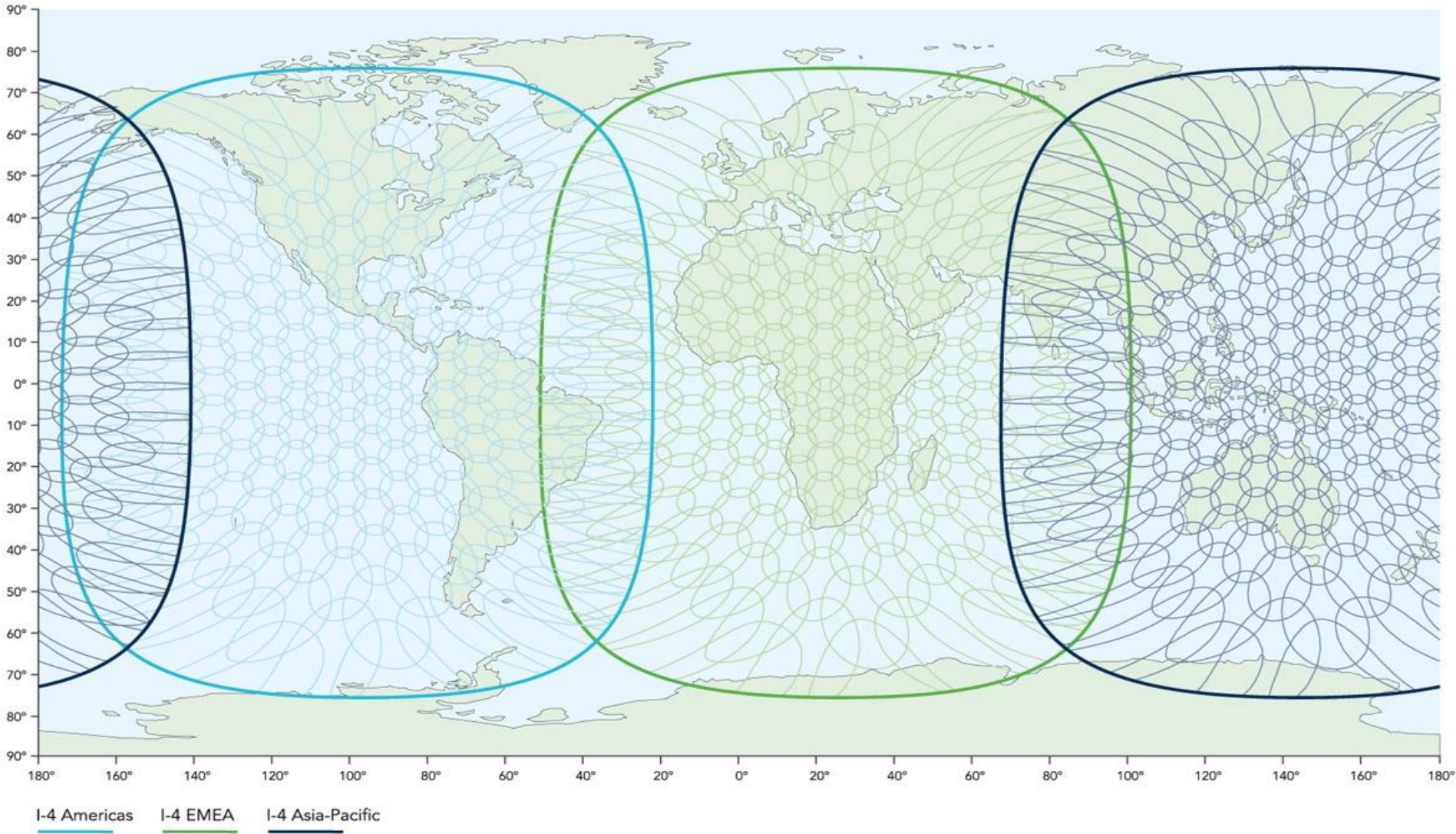
**Ka-Band**

# I-4 satellite constellation





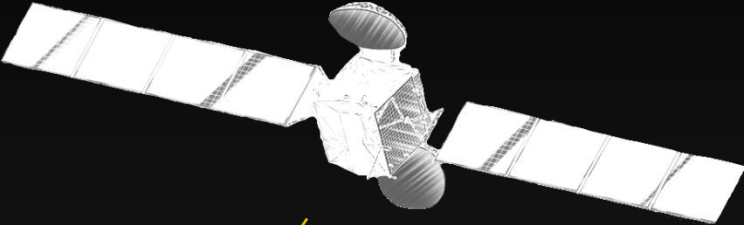
# Coverage map



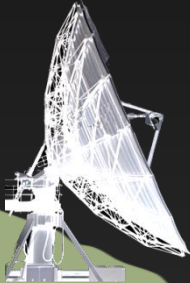
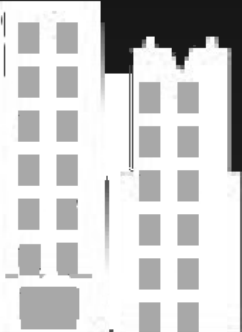


**inmarsat** Satellite Control Centre

I-4 satellite



NOC and SCC



SAS



terminal



Burum, Holland

Hawaii, USA

Fucino, Italy

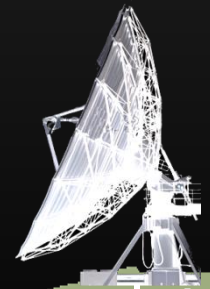
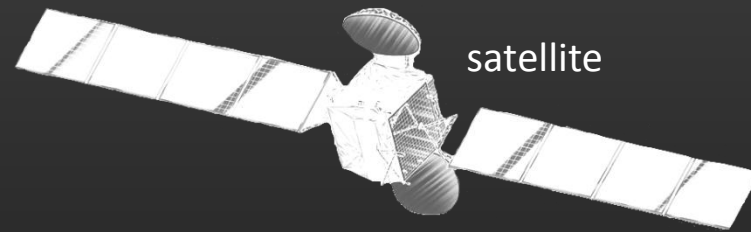


**Satellite Access Stations**



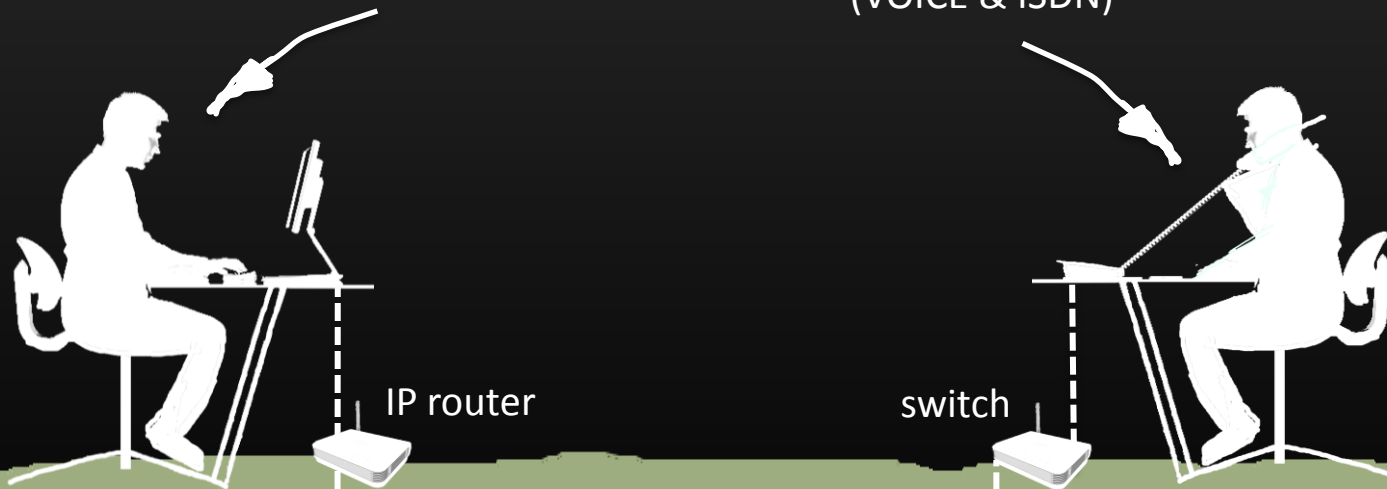


# SwiftBroadband network



(STANDARD/STREAMING IP)

(VOICE & ISDN)



**Internet**





**PSTN**



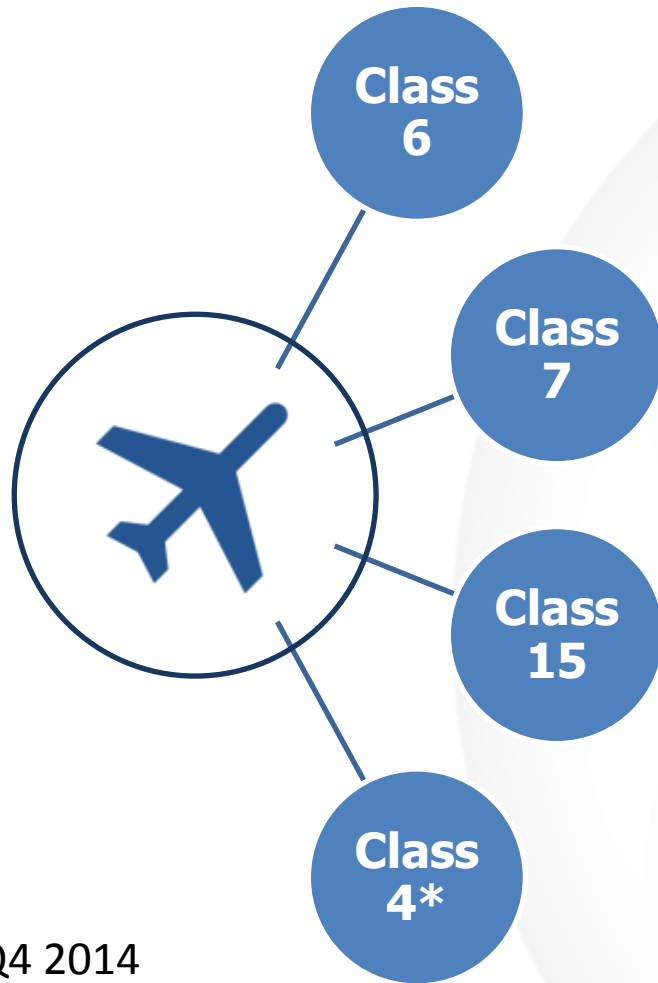
# **SwiftBroadband Products & Services**



# SwiftBroadband IP service types

Service Type	Chargeable by:	Quality of Service:
Standard IP		
Streaming IP		

# SwiftBroadband by terminal type

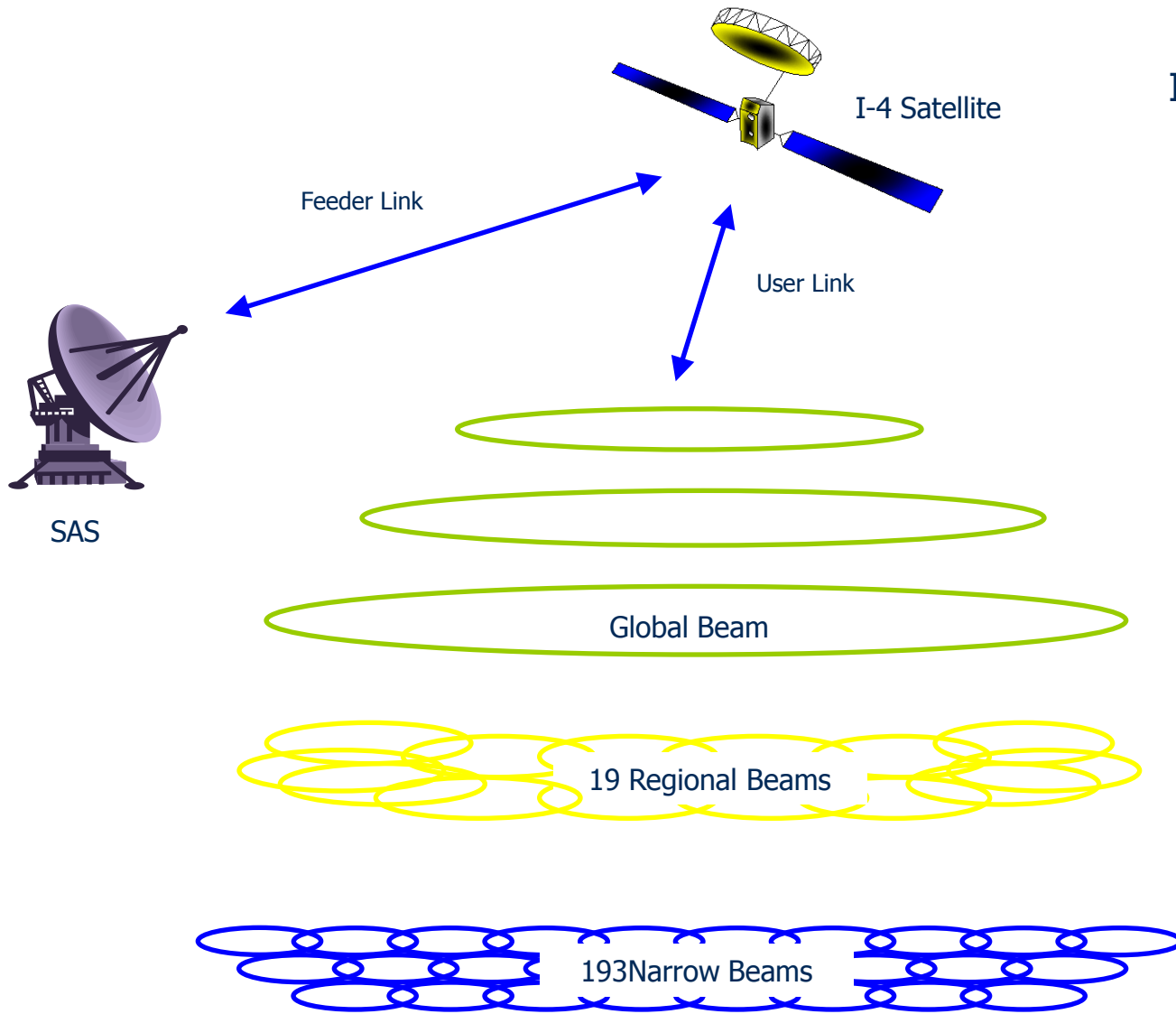


Services	Class 6 HGA	Class 7 IGA	Class 15 LGA	Class 4 ELGA
Voice 4k	✓	✓	✓	✓
ISDN 3.1k RDI UDI	✓	✗	✗	✗
Streaming IP	SB X-Stream	8-128kbps	8-16kbps	8-16kbps
Standard IP	Up to 432kbps	Up to 332kbps	Up to 200kbps	Up to 200kbps
Safety Service Approved	COMING SOON!	COMING SOON!	✗	COMING SOON!
SMS	✓	✓	✓	✓

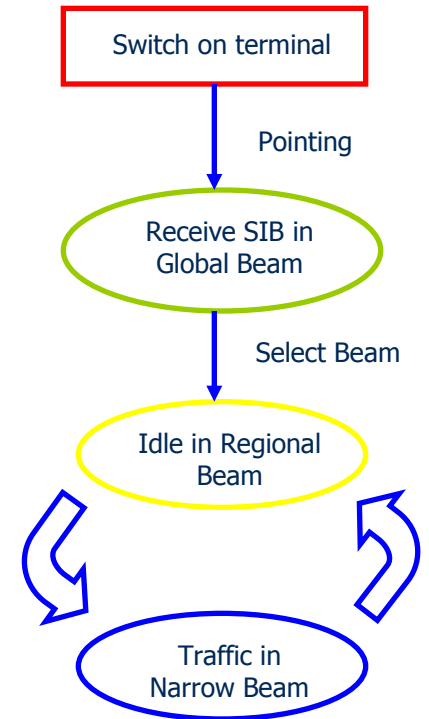
\*Q4 2014



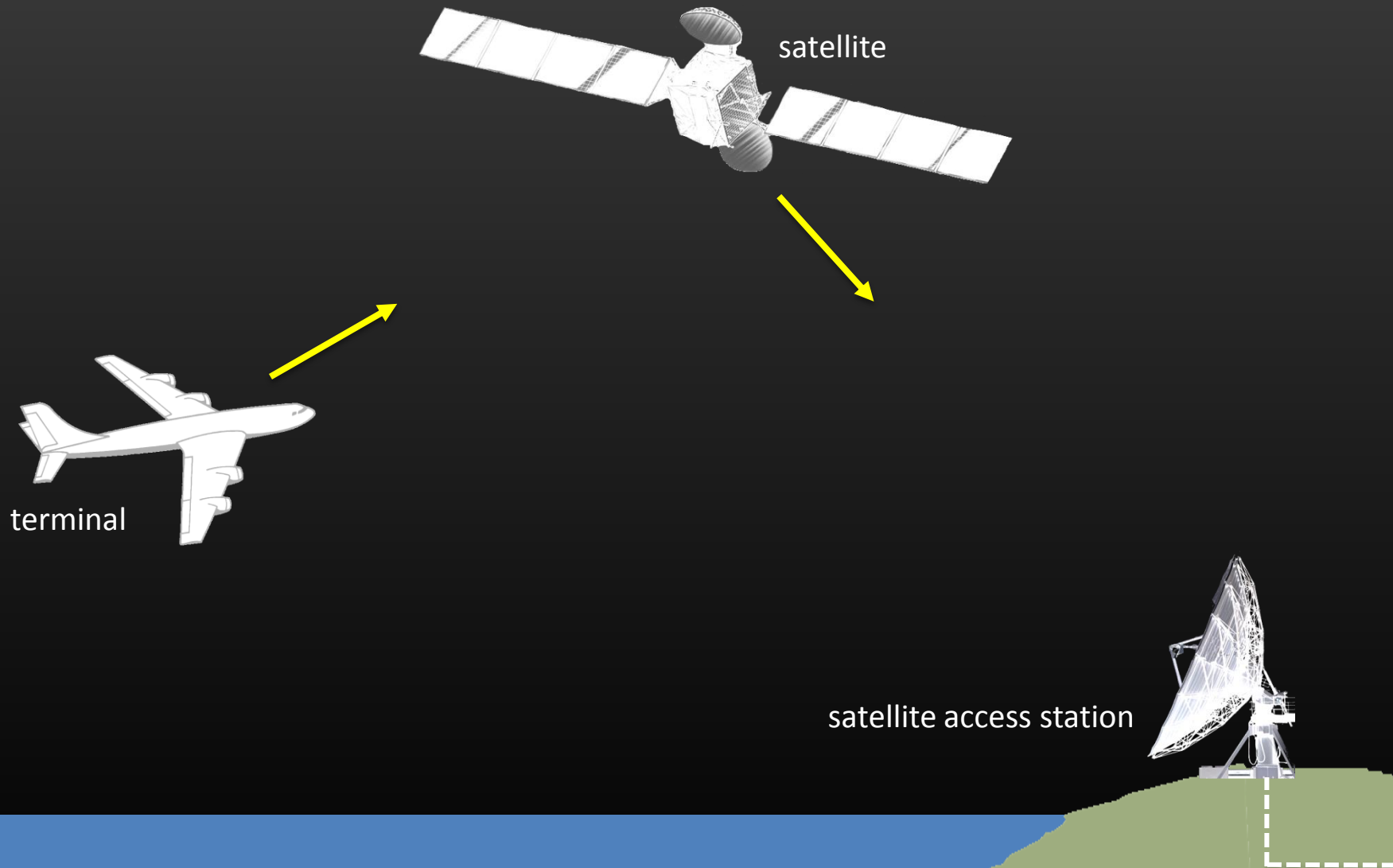
# **The SwiftBroadband Experience**



## I-4 Satellite beam hierarchy and functions



# 1. Internet





DP POP



DATA RECEIVED AT CUSTOMER HQ

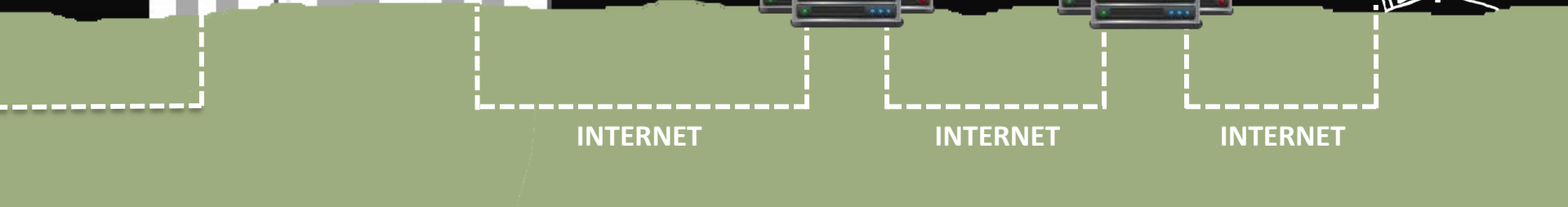
Not ideal for live video/audio  
(Internet can take any route)



INTERNET

INTERNET

INTERNET



DP POP



DATA RECEIVED AT CUSTOMER HQ

End 2 End QoS Live and  
Time critical applications  
with managed IP Link



LEASED LINE





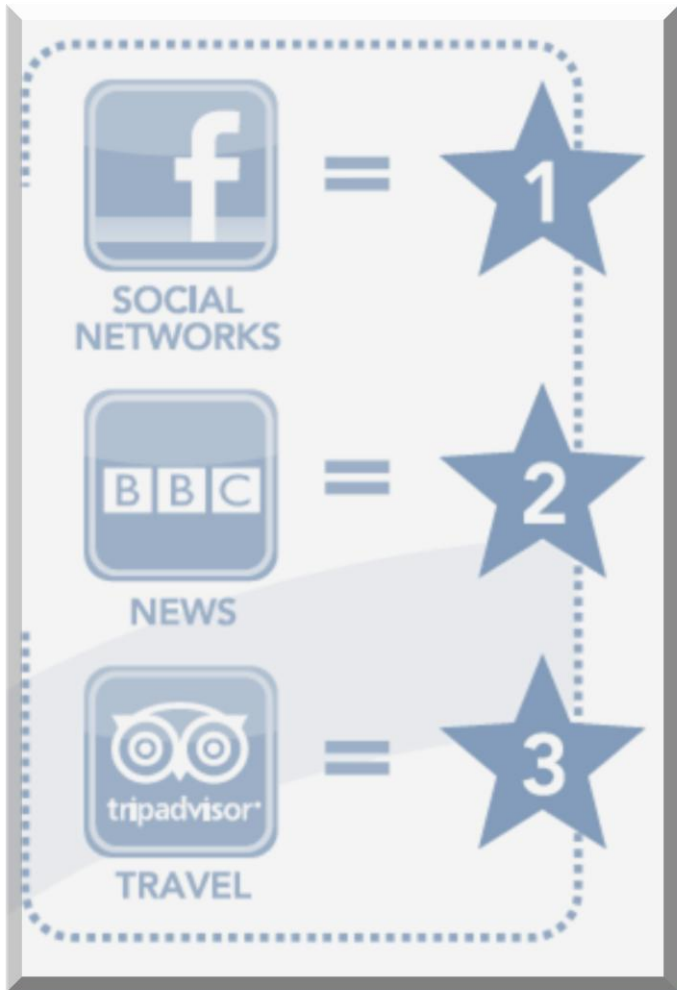
# **SwiftBroadband IP and applications**

# SwiftBroadband in Business Aviation



# What's happening on the ground...

## ... Is happening in the air



**Social media** – everywhere, everyday

450+ million tweets are sent everyday



1 in 7 min spent online is on Facebook



40+ million instagram pictures uploaded

### Online News

*The Dallas Morning News*

60% of Americans get their news from online sources

### Browsing



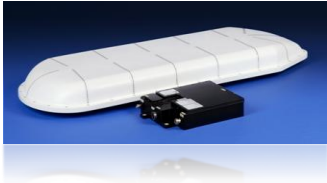
Internet sessions on board are typically light internet browsing.



# **SwiftBroadband & GX Aviation**

# SwiftBroadband evolution

## Key portfolio milestones



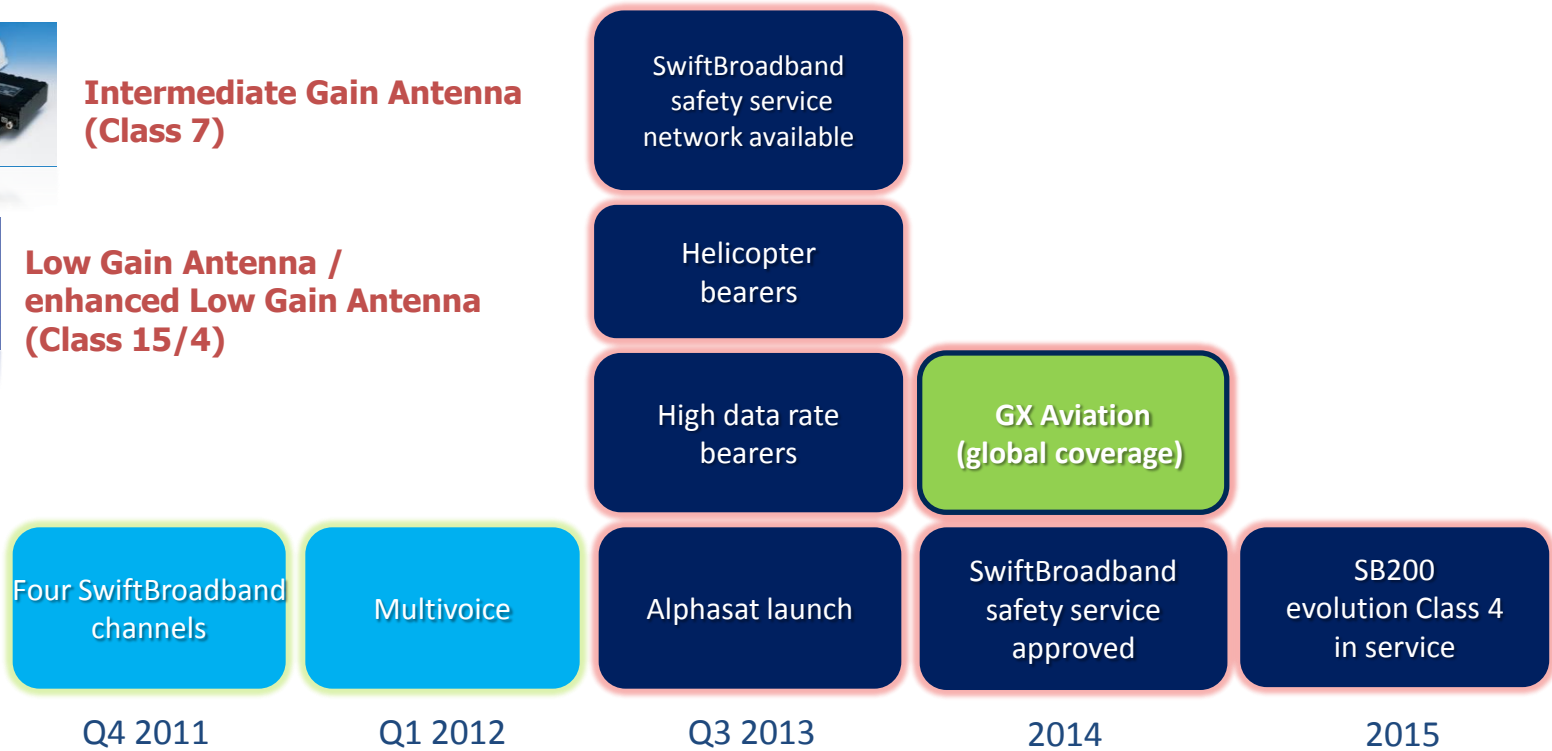
**High Gain Antenna  
(Class 6)**



**Intermediate Gain Antenna  
(Class 7)**



**Low Gain Antenna /  
enhanced Low Gain Antenna  
(Class 15/4)**



# We're having twins this year!

## Investing in L & Ka band networks



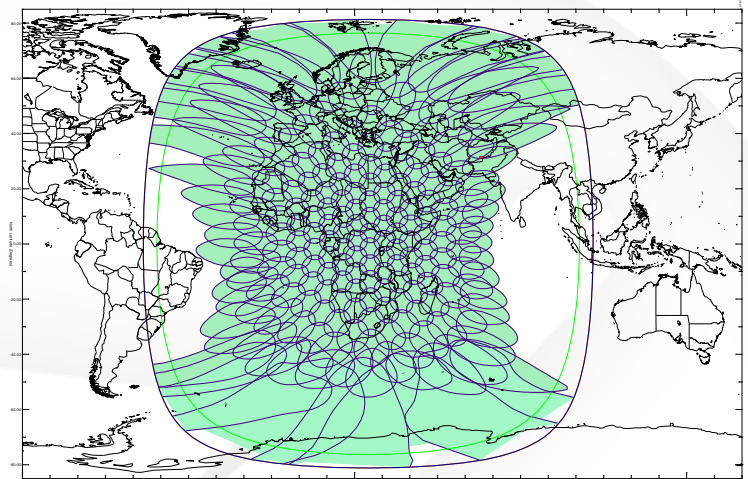
➤ Inmarsat is investing in capabilities to support market growth



# Alphasat I-XL satellite

## Our continued commitment to L-band

- Advanced L-band satellite to supplement the Inmarsat-4s
- Additional capacity over Europe, Africa and Middle East
- Will seamlessly replace I-4 satellite in EMEA region
- All I-4 services can be transitioned to Alphasat
- Existing I-4 becomes in-orbit spare
- New equipment available from 2012 able to access the new L-band frequencies ("XL-band")
- Planned launch in 2013
- European Space Agency (ESA) project
  - New Alphasat spacecraft platform
  - Six tonnes (6,000kg) at launch



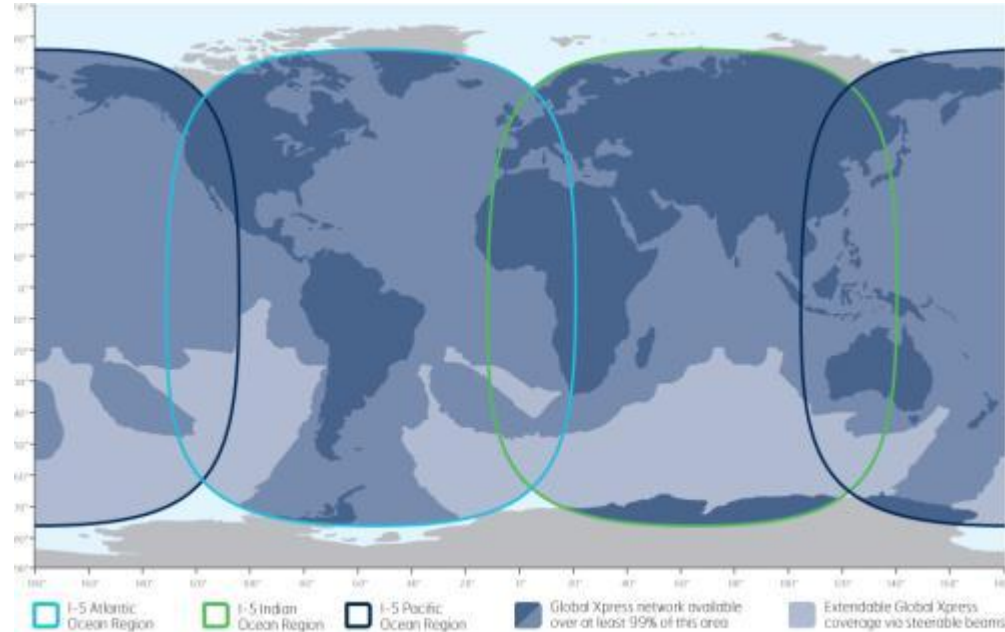


# **Global Xpress – the next generation of Inmarsat aviation connectivity**

# Global, mobile & reliable

## Over 20 years of service to aviation

- Global coverage - 2014
- Seamless handover within and between satellite regions
- State-of-the-art mobility management
- Optimised ground network – 6 SAS
- High network availability - SLA
- Only one company providing service
- Design fundamentals drive attractive pricing

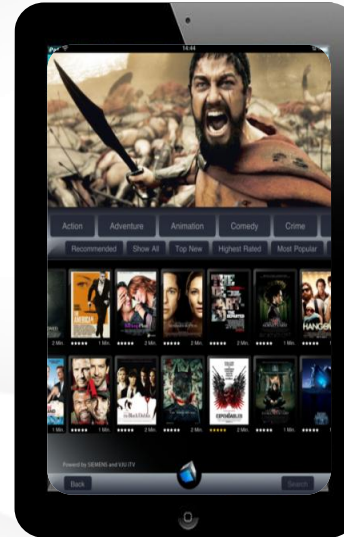


Global Xpress: 3 Geostationary Ka-band satellites

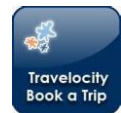
# Step change in aviation services with GX

## Future applications will require more & faster bandwidth

- GX brings flexible, upgradeable bandwidth options for passenger & airline services
- Supports live television and real-time television content
- Customisable content, tailored by airlines to their specific customer base
- Base service provides multicast channels of business, news and sports

A tablet displaying an 'AUS DEPARTURES' flight schedule. The table lists flights with columns for FLIGHT, DESTINATION, GATE, DEPARTS, and STATUS.

FLIGHT	DESTINATION	GATE	DEPARTS	STATUS
DELTA AIR 1238	ATLANTA	6	12:58 PM	SCHEDULED
DELTA AIR 1715	ATLANTA	6	3:58 PM	SCHEDULED
DELTA AIR 1131	ATLANTA	6	6:27 PM	SCHEDULED
SOUTHWEST 227	BALTIMORE	8	12:50 PM	SCHEDULED
JETBLUE 1284	BOSTON	18	4:17 PM	SCHEDULED
PIESA 2724	CHARLOTTE	20	11:48 PM	EN ROUTE
PIESA 2814	CHARLOTTE	20	4:58 PM	SCHEDULED
AMERICAN 895	CHICAGO	15	12:27 PM	EN ROUTE
SHUTTLE 7546	CHICAGO		1:48 PM	SCHEDULED



Global Xpress brings services capable of flexing as customer demands evolve

# Service Achievable per Terminal Type

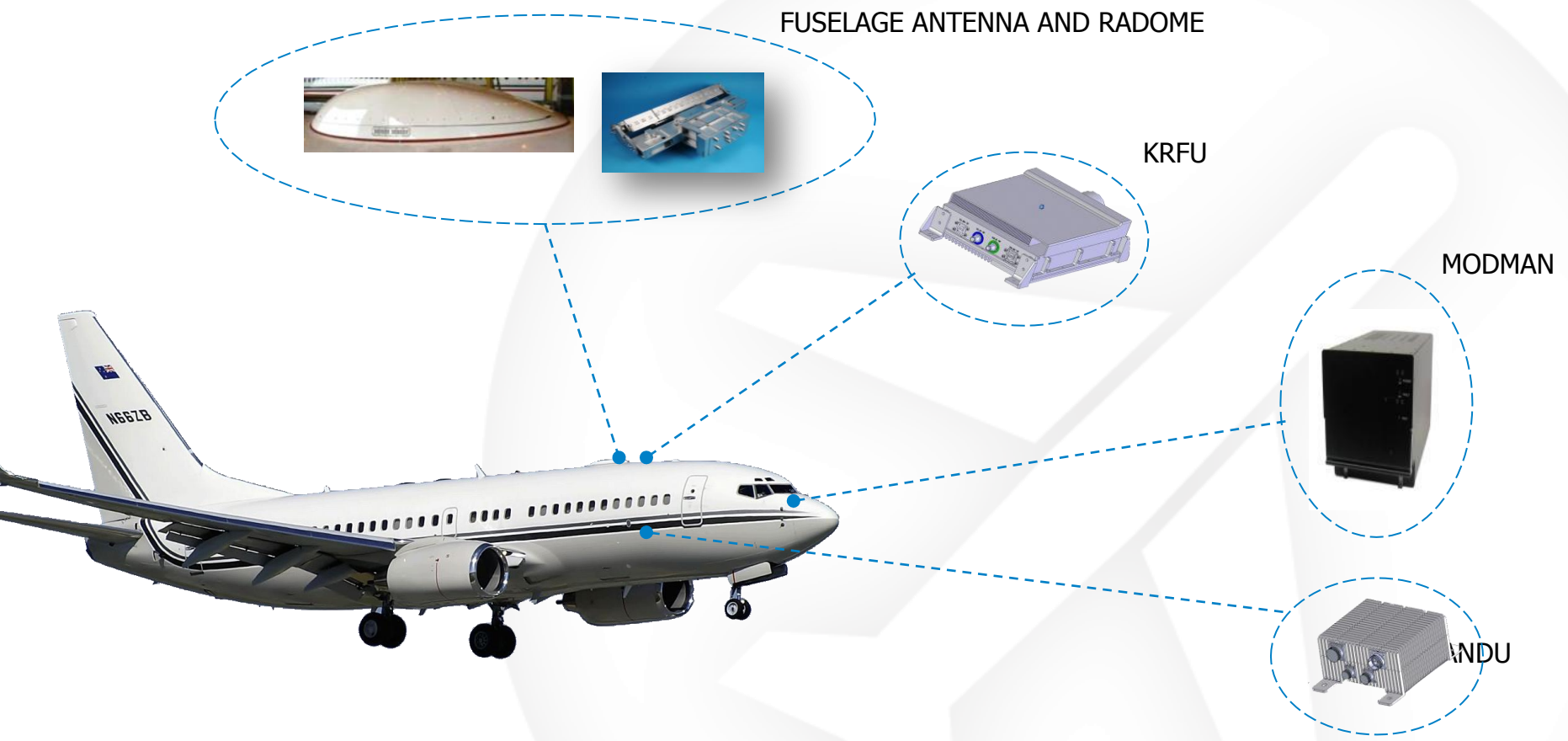
\*Based on current simulations

Antenna type	Throughput To the Aircraft (Forward Link)	Throughput From the Aircraft (Return Link)
Class A – FMA	38 - 49Mbps	3 - 4.7Mbps
Class B – TMA	21 - 33Mbps	1.4 - 2.2Mbps

GX Aviation Services will operate as a managed subscription service model  
Therefore the actual throughputs achieved by the terminal are dependent on  
the customer subscription

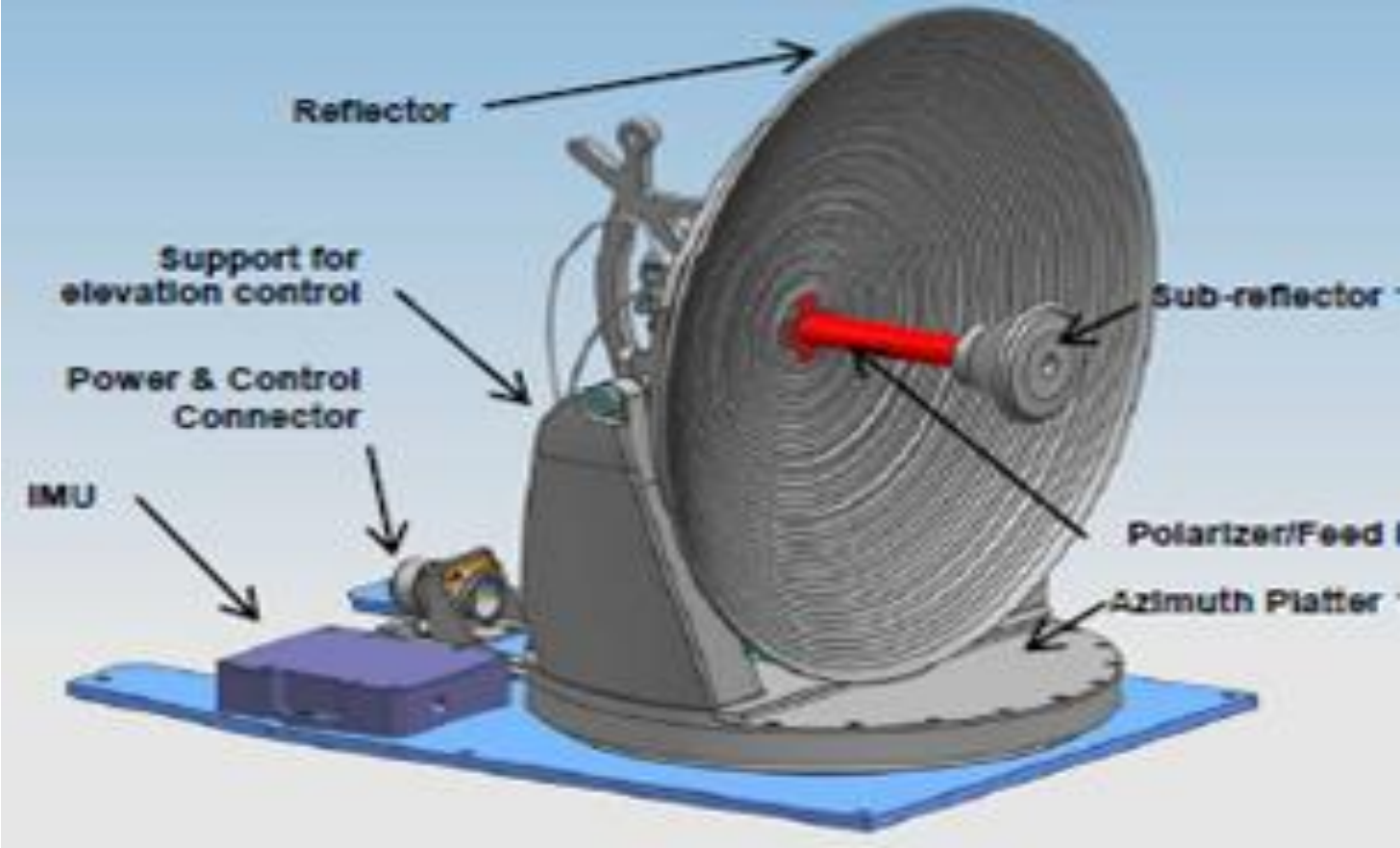
# GX Aviation Avionics

## Fuselage Mount



# GX Aviation Avionics

## Tail Mount





# Summary

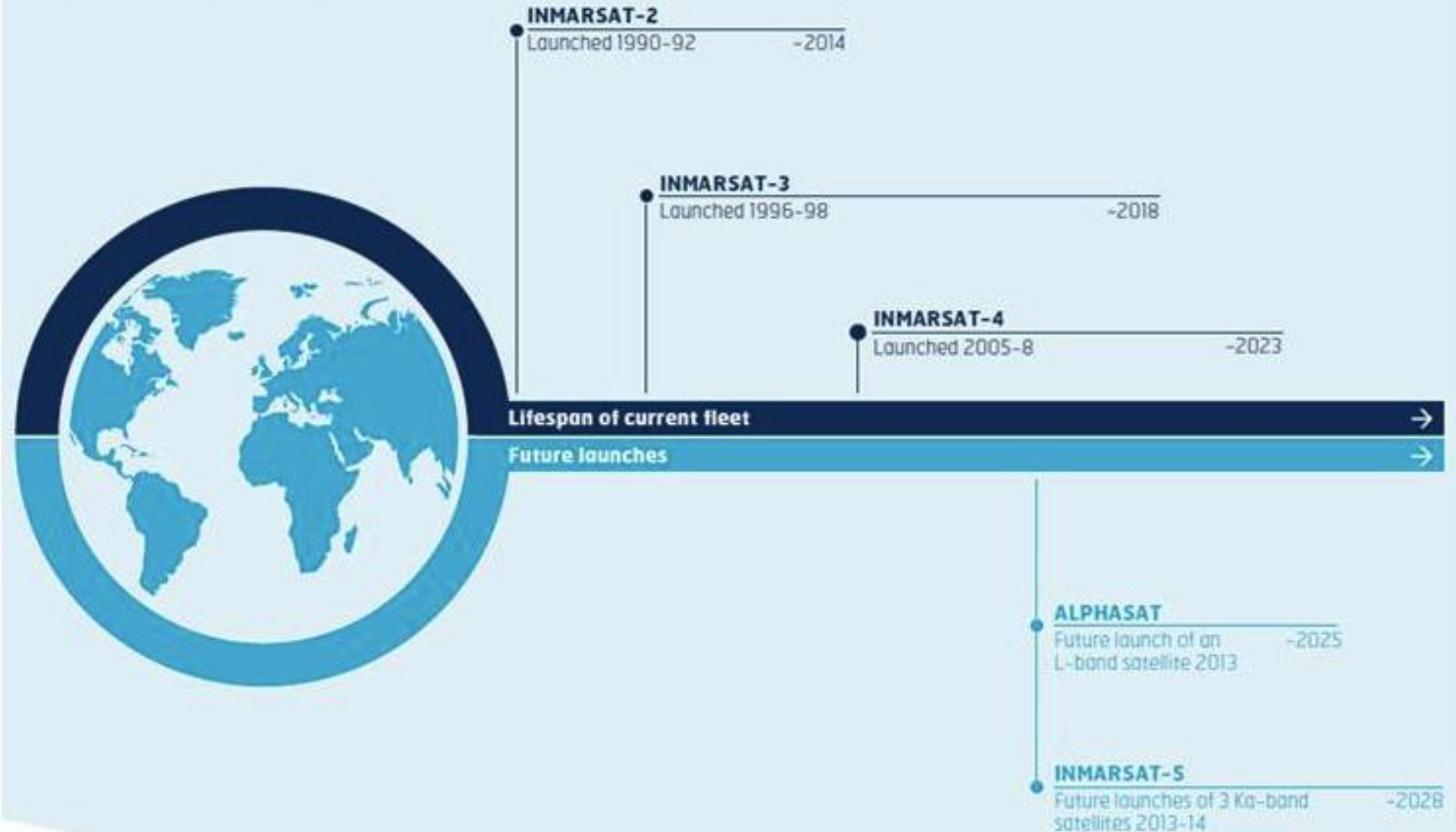




# Constellation Review

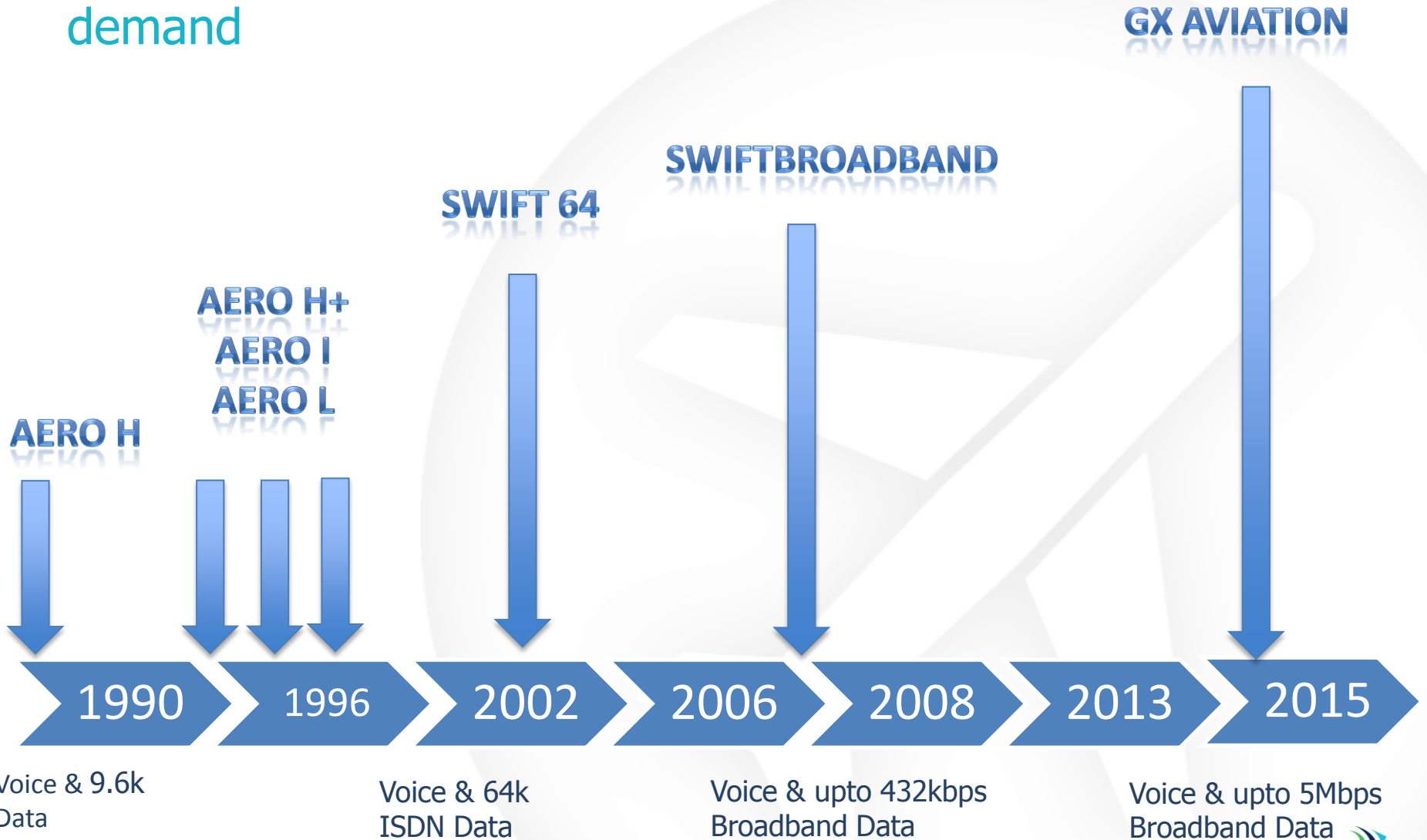
## FUTURE-PROOF

Our latest generation of award-winning Inmarsat-4 satellites will continue to deliver a range of L-band services to customers well into the 2020s. In addition, we are progressing our fully funded Global Xpress investment programme under which we will launch three Inmarsat-5 Ka-band satellites in the 2013-2014 timeframe.



# Inmarsat Aviation Connectivity

Evolving to meet operations and passenger demand





**Questions?**